Amendments to the Claims:

This Listing of Claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-22. (Cancelled)

Claims 23-25. (Cancelled)

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26. (Amended) The interrogator of Claim [23] <u>30</u>, wherein the first antenna and the second antenna are positioned substantially perpendicular to each other and the first phase magnetic field component and the second phase magnetic field component are in quadrature.

27. (Amended) The interrogator of Claim [23] <u>30</u>, further comprising:

C1 cont.

a first capacitor having a first end and a second end opposite said first end, said first end of said first capacitor coupled to a first end of said first antenna, said second end of said first capacitor coupled to a second end of said first antenna; and

a second capacitor having a first end and a second end opposite said first end, said first end of said second capacitor coupled to a first end of said second antenna, said second end of said second capacitor coupled to a second end of said second antenna.

28. (Amended) The interrogator of Claim [24] <u>30</u>, wherein said detector further comprises a pickup coil positioned perpendicular to both of said first and second antennae.

29. (Amended) The interrogator of Claim [23] <u>30</u>, wherein said driver circuit further comprises:

an oscillator adapted to generate a first signal at twice a carrier frequency; and

a phase splitter coupled to said oscillator and adapted to split said first signal into an in-phase component to be provided to said first antenna and a quadrature phase component to be provided to said second antenna.

30. (Amended) [The interrogator of Claim 25,] A radio frequency identification system interrogator, comprising:

a first antenna adapted to generate a first magnetic field component having a first phase;

a second antenna adapted to generate a second magnetic field component having a second phase;

a driver circuit coupled to the first and second antennae to provide at least one signal to cause the generation of first and second magnetic field components; whereby said first and second magnetic fields form a time varying composite magnetic field;

a detector for detecting a transponder signal modulated on said magnetic field;

a processor for processing the transponder signal; and

C1 cont.

wherein said processor further comprises:

at least one potentiometer coupled to said detector and adapted to nullify interference on said detected signal;

an amplifier coupled to said at least one potentiometer and adapted to amplify said detected signal;

a filter coupled to said amplifier and adapted to filter said detected signal;

a demodulator coupled to said filter and adapted to demodulate said detected signal;

at least one decoder coupled to said demodulator and adapted to decode said demodulated signal; and

a signal processor coupled to said at least one decoder and adapted to process said decoded signal.

31. (Amended) The interrogator of Claim [25] <u>30</u>, further comprising a display coupled to said processor, wherein said processor provides said processed signal to said display, said display adapted to display said processed signal in a format understandable by a user.

32. (Amended) The interrogator of Claim [25] <u>30</u>, further comprising an audio transducer coupled to said processor, said audio transducer adapted to receive a signal from said processor and produce an audible tone when a transponder is detected.

33. (Amended) The interrogator of Claim [23] <u>30</u>, further comprising a third antenna adapted to generate a third magnetic field component, said driver further coupled to said third antenna and driving said third antenna with a signal to generate said third magnetic field component to precess said composite magnetic field.

C1 cont.

34. (Previously Presented) The interrogator of Claim 33, wherein said third antenna is perpendicular to said first and second antenna.

35. (Previously Presented) The interrogator of Claim 33, further comprising a capacitor having a first end and a second end opposite said first end, said capacitor disposed between said third antenna and said driver, said first end coupled to said driver, and said second end coupled to a first end of said third antenna.

36. (Previously Presented) The interrogator of Claim 35, further comprising a second capacitor having a first end and a second end opposite said first end, said second capacitor disposed between said capacitor and said third antenna, said first and second end of said second capacitor coupled to a first and second end of said third antenna, respectively.

37. (Amended) The interrogator of Claim [23] <u>30</u>, wherein the driver circuit provides a time varying signal to cause said composite magnetic field to rotate.

38. (Previously Presented) A radio frequency identification system, comprising:

an interrogator having,

a first coil inductor adapted to generate a first magnetic field component having a first phase;

a second coil inductor adapted to generate a second magnetic field component having a second phase, said first coil inductor and said second coil inductor mounted substantially perpendicular to each other and the first phase and the second phase are in quadrature;

means for exciting said first and second magnetic fields at a first frequency for generating a composite magnetic field which rotates;

C1 cont.

a passive detector for receiving the electromagnetic signal from said interrogator and transmitting a modulated electromagnetic signal to the interrogator at a second frequency, higher than said first frequency.

Claim 39. (Cancelled)

Claims 40 and 41. (Cancelled)

42. (Amended) The interrogator of Claim [23] <u>30</u>, further comprising a third antenna which generates a third magnetic field component which precesses said composite magnetic field.

43. (Previously Presented) The interrogator of Claim 38, wherein said driver further comprises: an oscillator adapted to generate a first signal at twice a carrier frequency; and a phase splitter coupled to said oscillator and adapted to split said first

signal into an in-phase component to drive said first coil and a quadrature phase component to drive said second coil at said carrier frequency.

44. (Amended) [The interrogator of Claim 39,] An interrogator for an identification system, comprising:

a first coil;

a second coil;

a driver coupled to and driving said first coil and said second coil by providing a time varying signal to each of said first and second coils to cause said coils to generate a rotating magnetic field;

a detector for detecting a transponder signal modulated on said rotating magnetic field; and

a processor for processing said transponder signal;

wherein said processor further comprises: at least one potentiometer coupled to said detector and adapted to nullify interference on said transponder signal; an amplifier coupled to said at least one potentiometer and adapted to amplify said transponder signal; a filter coupled to said amplifier and adapted to filter said transponder signal; a demodulator, coupled to said filter and adapted to demodulate said transponder signal; at least one decoder coupled to said demodulator and adapted to decode said transponder signal; and a signal processor coupled to said at least one decoder and adapted to process said transponder signal.

C1 cont.

45. (Amended) The interrogator of Claim [39] 44, wherein said driver splits a generated signal into an in-phase component to drive said first coil and a quadrature phase component to drive said second coil.

46. (Previously Presented) An interrogator for an inductively-coupled identification system, comprising:

a plurality of coils positioned relative to one another and adapted so as to generate a composite rotating magnetic field having an approximately constant amplitude in all orientations relative to a transponder.

47. (Previously Presented) The interrogator of Claim 46, wherein said plurality of coils includes a first coil adapted to generate a first magnetic field component having a first phase and a second coil adapted to generate a second magnetic field component having a second phase.

48. (Previously Presented) The interrogator of Claim 47, wherein said first and second coils are positioned substantially perpendicular to each other.

49. (Previously Presented) The interrogator of Claim 48, wherein the first phase and the second phase are in quadrature.

C1 cont.

50. (Previously Presented) The interrogator of Claim 47, wherein the first phase magnetic field component and the second phase magnetic field component are in quadrature.

51. (Previously Presented) The interrogator of Claim 47, further comprising a pickup coil positioned perpendicular to both of said first and second coils.

52. (Previously Presented) The interrogator of Claim 46, further comprising a detector which detects a transponder signal modulated on the composite rotating magnetic field.

53. (Previously Presented) The interrogator of Claim 52, further comprising a processor which processes the transponder signal.

54. (Previously Presented) The interrogator of Claim 46, further comprising a series drive capacitor for each of said coils and through which said coils are driven, and a parallel tank capacitor for each said coil, wherein said series drive capacitor and said parallel tank capacitor provide an impedance matching network.

55. (Previously Presented) The interrogator of Claim 46, further comprising a precession coil which generates a magnetic field component to precess said composite rotating magnetic field.

56. (Previously Presented) The interrogator of Claim 55, wherein said precession coil is aligned relative to said plurality of coils and driven with a signal offset in frequency from at least one signal driving said plurality of coils.

C1 cont.

57. (Previously Presented) The interrogator of Claim 46, wherein said composite rotating magnetic field does not make a complete rotation and changes direction sufficiently to capture transponders with unfavorable orientations.

58. (Previously Presented) The interrogator of Claim 46, further comprising impedance matching means for matching the impedance of said coils to a drive circuit of the interrogator.

59. (Previously Presented) The interrogator of Claim 58, wherein said impedance matching means includes at least one of series and tank capacitors connected to said coils.

60. (Previously Presented) The interrogator of Claim 46, wherein said coils are disposed perpendicular to one another.

61. (Previously Presented) The interrogator of Claim 60, wherein a transponder in the plane of the axes of said coils senses an alternating magnetic field of full amplitude regardless of the angle of a transponder coil of the transponder with respect to said coils of the interrogator.

62. (Previously Presented) The interrogator of Claim 46, further comprising an impedance matching network, said network including a capacitor in parallel with one of said coils and a series drive capacitor which matches the impedance of the capacitor to a driven load impedance.

63. (New) A radio frequency identification system interrogator, comprising:

a first antenna adapted to generate a first magnetic field component having a first phase;

C1 cont-

a second antenna adapted to generate a second magnetic field component having a second phase;

a driver circuit coupled to the first and second antennae to provide at least one signal to cause the generation of first and second magnetic field components; whereby said first and second magnetic fields form a time varying composite magnetic field; and

a third antenna adapted to generate a third magnetic field component, said driver further coupled to said third antenna and driving said third antenna with a signal to generate said third magnetic field component to precess said composite magnetic field.

64. (New) The interrogator of Claim 63, wherein said third antenna is perpendicular to said first and second antennae.

65. (New) The interrogator of Claim 63, further comprising a capacitor having a first end and a second end opposite said first end, said capacitor disposed between said third antenna and said driver, said first end coupled to said driver, and said second end coupled to a first end of said third antenna.

66. (New) The interrogator of Claim 65, further comprising a second capacitor having a first end and a second end opposite said first end, said second capacitor disposed between said capacitor and said third antenna, said first and second end of said second capacitor coupled to a first and second end of said third antenna, respectively.

67. (New) A radio frequency identification system interrogator, comprising:

a first antenna adapted to generate a first magnetic field component having a first phase;

a second antenna adapted to generate a second magnetic field component having a second phase;

a driver circuit coupled to the first and second antennae to provide at least one signal to cause the generation of first and second magnetic field components; whereby said first and second magnetic field components form a time varying composite magnetic field; and

a third antenna which generates a third magnetic field component which precesses said composite magnetic field.

C1 Cont.

68. (New) A radio frequency identification system interrogator, comprising:

a first antenna adapted to generate a first magnetic field component having a first phase;

a second antenna adapted to generate a second magnetic field component having a second phase;

a driver circuit coupled to the first and second antennae to provide at least one signal to generate first and second magnetic field components; whereby said first and second magnetic field components form a time varying composite magnetic field; and

a series drive capacitor for each of said antennae and through which said antennae are driven, and a parallel tank capacitor for each said antenna, wherein said

series drive capacitor and said parallel tank capacitor provide an impedance matching network.

69. (New) The interrogator of Claim 68, further comprising a detector for detecting a transponder signal modulated on said magnetic field.

70. (New) The interrogator of Claim 69, further comprising a processor for processing the transponder signal.

71. (New) The interrogator of Claim 70, further comprising a display coupled to said processor, wherein said processor provides said processed signal to said display, said display adapted to display said processed signal in a format understandable by a user.

Cl cont.

72. (New) The interrogator of Claim 70, further comprising an audio transducer coupled to said processor, said audio transducer adapted to receive a signal from said processor and produce an audible tone when a transponder is detected.

73. (New) The interrogator of Claim 69, wherein said detector further comprises a pickup coil positioned perpendicular to both of said first and second antennae.

74. (New) The interrogator of Claim 68, wherein said first antenna and said second antenna are positioned substantially perpendicular to each other and said first phase magnetic field component and said second phase magnetic field component are in quadrature.

75. (New) The interrogator of Claim 68, wherein said driver circuit includes: an oscillator adapted to generate a first signal at twice a carrier frequency; and a phase

splitter coupled to said oscillator and adapted to split said first signal into an in-phase component to be provided to said first antenna and a quadrature phase component to be provided to said second antenna.

76. (New) The interrogator of Claim 68, further comprising a third antenna adapted to generate a third magnetic field component, said driver further coupled to said third antenna and driving said third antenna with a signal to generate said third magnetic field component to precess said composite magnetic field.

77. (New) The interrogator of Claim 68, wherein said third antenna is perpendicular to said first and second antennae.

78. (New) The interrogator of Claim 68, wherein said driver circuit provides a time varying signal to cause said composite magnetic field to rotate.

C1 cont.

79. (New) An interrogator for an inductively-coupled identification system, comprising:

a plurality of coil means for generating a composite rotating magnetic field having an approximately constant amplitude in all orientations relative to a transponder; and

a series drive capacitor for each of said coil means and through which said coil means are driven, and a parallel tank capacitor for each of said coil means, wherein said series drive capacitors and said parallel tank capacitors provide an impedance matching network.

80. (New) The interrogator of Claim 79, wherein said series drive capacitor and said parallel tank capacitors are adapted to allow the independent adjustment of both resonant frequency and input impedance of the interrogator.

81. (New) The interrogator of Claim 79, wherein said plurality of coil means includes a first coil adapted to generate a first magnetic field component having a first phase and a second coil adapted to generate a second magnetic field component having a second phase.

82. (New) The interrogator of Claim 81, wherein said first and second coils are positioned substantially perpendicular to each other.

83. (New) The interrogator of Claim 81, wherein said first phase and said second phase are in quadrature.

84. (New) The interrogator of Claim 81, further comprising a pickup coil positioned perpendicular to both of said first and second coils.

Cl. cont.

85. (New) The interrogator of Claim 79, further comprising a detector which detects a transponder signal modulated on said composite rotating magnetic field.

86. (New) The interrogator of Claim 85, further comprising a processor which processes said transponder signal.

87. (New) The interrogator of Claim 79, further comprising a precession coil which generates a magnetic field component to precess said composite rotating magnetic field.

88. (New) The interrogator of Claim 87, wherein said precession coil is aligned relative to said plurality of coil means and driven with a signal offset in frequency from at least one signal driving said plurality of coil means.

89. (New) The interrogator of Claim 79, wherein said composite rotating magnetic field does not make a complete rotation and changes direction sufficiently to capture transponders with unfavorable orientations.

90. (New) The interrogator of Claim 79, wherein interrogator coils of said plurality of coil means are disposed perpendicular to one another.

91. (New) The interrogator of Claim 90, wherein a transponder in the plane of the axes of said coils senses an alternating magnetic field of full amplitude regardless of the angle of a transponder coil of the transponder with respect to said coils of the interrogator.

C1 contd.

92. (New) An inductively-coupled identification system interrogator, comprising:

coil means for generating a composite rotating magnetic field having an approximately constant amplitude in all orientations relative to a transponder; and

said coil means including a series drive capacitor for each coil of said coil means and through which said coils are driven, and a parallel tank capacitor for each of said coils, wherein said series drive capacitors and said parallel tank capacitors together allow for the independent adjustment of both resonant frequency and input impedance of the interrogator.